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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/974,975	10/12/2001	Hans Martin Hertz	09/974,975	8104

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EXAMINER

YUN, JURIE

ART UNIT

PAPER NUMBER

2882

DATE MAILED: 07/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/974,975

Applicant(s)

HERTZ ET AL.

Examiner

Jurie Yun

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-14 and 18-32 is/are rejected.
- 7) ☒ Claim(s) 3 and 15-17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5,6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Sweden on 10/13/00. It is noted, however, that applicant has not filed a certified copy of the 0003715-0 application as required by 35 U.S.C. 119(b).

Specification

2. The abstract of the disclosure is objected to because it contains more than 150 words. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the

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remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 2 recites the broad recitation "ohmic heating of the outlet", and the claim also recites "preferably at an orifice thereof" which is the narrower statement of the range/limitation.

5. Regarding claims 6 and 20, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1, 4, 8, 9, 14, 18, and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Haas et al. (USPN 6,190,835 B1).

8. With respect to claims 1 and 14, Haas et al. disclose a method of generating X-ray or EUV radiation, comprising the steps of:

(i) urging a substance (42) through an outlet (36) to generate a jet in a direction from the outlet (column 5, lines 17-33),

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(ii) directing at least one energy beam onto the jet, the energy beam interacting with the jet to generate said X-ray or EUV radiation (column 6, lines 11-14 and column 7, lines 31-33), and

(iii) controlling the temperature of said outlet, such that the stability of said jet is improved (column 12, lines 22+).

9. With respect to claims 4 and 18, Haas et al. disclose the jet leaves the outlet in a condensed state (column 4, lines 66-67).

10. With respect to claims 8, 9, and 21, Haas et al. disclose the energy beam is directed onto at least one droplet of the jet and onto a spray of droplets or clusters formed from the jet (column 5, lines 17-33).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 7, 10-13, and 22-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haas et al. (USPN 6,190,835 B1) as applied to claims 1, 4, and 14 above, and further in view of Hertz et al. (USPN 6,002,744).

13. With respect to claims 7, 13, and 25, Haas et al. do not disclose the energy beam is directed onto a spatially continuous portion of the jet, wherein the energy beam is focused to essentially coincide with the spatially continuous portion over a length thereof. Hertz et al. disclose the energy beam (3) is directed onto a spatially continuous

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portion of the jet (17), wherein the energy beam is focused to essentially coincide with the spatially continuous portion over a length thereof (column 2, lines 42+). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Haas et al. invention and have the energy beam directed onto a spatially continuous portion of the jet wherein the energy beam is focused to essentially coincide with the spatially continuous portion over a length thereof, to improve stability since slow drifts no longer affect the X-ray emission, as disclosed by Hertz et al. (column 2, lines 54-55).

14. With respect to claims 10 and 22, Haas et al. do not disclose the jet is cooled by evaporation to a frozen state, and the energy beam is directed onto a frozen portion of the jet. Hertz et al. disclose the jet is cooled by evaporation to a frozen state, and the energy beam is directed onto a frozen portion of the jet (column 4, lines 26-30). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Haas et al. invention and have the jet cooled by evaporation to a frozen state, and to have the energy beam directed onto a frozen portion of the jet, as disclosed by Hertz et al., because any type of target, whether it be in gas, liquid or solid form, would be suitable as long as it yields radiation upon being hit by an energy beam.

15. With respect to claims 11 and 23, Haas et al. do not disclose the energy beam comprises pulsed laser radiation which interacts with the jet to form a plasma emitting said X-ray or EUV radiation. Hertz et al. disclose the energy beam comprises pulsed laser radiation which interacts with the jet to form a plasma emitting said X-ray or EUV radiation (column 3, line 25). It would have been obvious to one of ordinary skill in the

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art at the time the invention was made to modify the Haas et al. invention and have the energy beam comprise pulsed laser radiation which interacts with the jet to form a plasma emitting said X-ray or EUV radiation, as taught by Hertz et al. because this would allow for radiation useful for proximity lithography, if desired (column 3, lines 18-30).

16. With respect to claims 12 and 24, Haas et al. do not disclose the energy beam is focused on the jet to essentially match a transverse dimension of the energy beam to a transverse dimension of the jet. Hertz et al. disclose the energy beam is focused on the jet to essentially match a transverse dimension of the energy beam to a transverse dimension of the jet (column 4, lines 50-54). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Haas et al. invention and have the energy beam focused on the jet to essentially match a transverse dimension of the energy beam to a transverse dimension of the jet, as taught by Hertz et al., because this would ensure stable radiation emission.

17. With respect to claims 26-32, Haas et al. do not disclose the step of performing X-ray microscopy, or performing proximity lithography, or performing EUV projection lithography, or performing photoelectron spectroscopy, or performing X-ray fluorescence, or performing X-ray diffraction, or performing a medical diagnosis with the generated radiation. Hertz et al. disclose these procedures (column 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Haas et al. invention to include the step of performing X-ray microscopy, or performing proximity lithography, or performing EUV projection lithography, or

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performing photoelectron spectroscopy, or performing X-ray fluorescence, or performing X-ray diffraction, or performing a medical diagnosis with the generated radiation, so as to broaden the industrial applicability of the invention.

18. Claims 5, 6, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haas et al. (USPN 6,190,835 B1) as applied to claims 1 and 14 above.

19. With respect to claims 5, 6, 19, and 20, Haas et al. do not disclose the substance comprises a noble gas which is cooled to a liquid state before being urged through the outlet. Haas et al. disclose the use of a noble gas which is cooled to a liquid state after being urged through the outlet (column 4, lines 6-42). Haas et al. are silent as to the gas being cooled to a liquid state before exiting the nozzle, however, one of ordinary skill in the art would know that this could be the case. Haas et al. disclose (column 4, lines 66-67), "In operation, the process fluid supply line 24 may provide pressurized process fluid 42 in the form of a gas, liquid, or mixture to the nozzle 36." It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Haas et al. invention and have the substance comprise a noble gas which is cooled to a liquid state before being urged through the outlet due to the fact that any form of the target exiting the nozzle is known to be suitable in such a system to produce X-ray or EUV radiation.

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Allowable Subject Matter

20. Claim 2 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

21. Claims 3 and 15-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

22. The following is a statement of reasons for the indication of allowable subject matter: Prior art fails to disclose controlling the temperature comprises effecting ohmic heating of the outlet, ~~preferably~~ at an orifice thereof. Prior art also fails to disclose controlling the temperature comprises directing radiation energy onto the outlet.

Conclusion

23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kondo et al. (USPN 6,504,903 B1) disclose a laser-excited plasma light source. Haas et al. (USPN 6,552,350 B2) disclose a lithographic light source.

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jurie Yun whose telephone number is 703 308-3535. The examiner can normally be reached on Monday-Friday 8:30-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on 703 308-4858. The fax phone numbers for the

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organization where this application or proceeding is assigned are 703 308-7722 for regular communications and 703 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-0956.

Jurie Yun
June 26, 2003


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